

## STUDIES IN ACANTHACEAE TRIBE NELSONIEAE I: NEW AND RE-NAMED TAXA

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**ABSTRACT.** Two African species of *Staurogyne* are segregated as a new genus, *Anisosepalum*; a new subgenus of *Elytraria* is proposed for the two Madagascar species, one of them new; eleven new Asiatic species of *Staurogyne*, five new combinations and one new name are proposed.

### INTRODUCTION

As part of the work for a Ph.D. thesis, submitted in July 1971 to the University of Edinburgh, a review was undertaken of the group usually referred to as Acanthaceae subfamily *Nelsonioideae* Lindau. This led to the conclusion that the group is better classified at tribal, and not subfamily, rank. This first contribution contains the formal publication of the new taxa and nomenclatural changes. The main morphological study and taxonomic evaluation will follow in a subsequent paper.

The genera in this account are arranged alphabetically while the species in *Staurogyne* are arranged systematically according to their subgenera and sections.

### NEW TAXA

**Anisosepalum** E. Hossain, **gen. nov.**; maxime ut *Staurogyne* Wall., sed bracteolis ad calycem adnatis, corollis palatis propriis praeditis, ovulis paucioribus, seminibus rugosis et forma stigmatis ab ea facile distinguendum.

*Herbae* erectae vel suffrutices repentes, terrestres vel epiphyticae, aliquando ad nodos radicales, annuae vel perennes. *Folia* omnia opposita, integra parum lobata vel serrulata. *Flores* tres usque numerosi, in racemos terminales vel terminales et axillares laxis vel condensatis dispositi. *Bracteeae* herbaceae, liberae vel usque ad medium pedicellum connatae. *Bracteolae* magnae, herbaceae, ad apicem pedicelli insertae, lobos laterales calycis occultantes. *Calyx* 5-partitus; lobi basi connati manifeste inaequales; laterales minuti, hyalini, uninervi; ceteri trinervi. *Corolla* infundibuliformis manifeste bilabiata; labium superum cucullatum et ad apicem leviter bilobatum; labium inferum trilobatum, lobis valde inaequalibus; lobus medius latissimus palato elevato praeditus. *Stamina* 4, didynama, inclusa; antherae thecae subglobosae, biloculares; connectiva lata et incrassata. *Grana* pollinis tricolporoidata vel tricolporata. *Staminodium* 1 vel 0. *Discus* annularis, pulviniformis. *Ovarium* glabrum, ovulis 6-8 in utroque loculo in series duas dispositis. *Stylus* sparsim papillosus. *Stigma* profunde bifurcatum; lobus superus iterum bifurcatus. *Capsula* oblonga, obtusa vel acuta, non-stipitata, ad apicem subtruncata, parte superiore sterili, in valvos duos lignosos recurvatos loculicide dehiscens. *Semina* obovata, atra, ventraliter et leviter compressa, omnia retinaculo non indurato suffulta; retinacula tempore dehiscentiae desiccata et lapsa; testae rugosae, excavationibus hili magnis instructae; endospermium copiosum et ruminatum.

Typus generis: *A. humbertii* (Mildbr.) E. Hossain, **comb. nov.**

Syn.: *Staurogyne humbertii* Mildbr. in Bull. Jard. Bot. Brux. 14: 353 (1937). Species duae in Africa centrali.

**A. alboviolaceum** (R. Ben.) E. Hossain, **comb. nov.**

Syn.: *Staurogyne alboviolacea* R. Ben. in Not. Syst. ed. Humbert 11: 151 (1944).

subsp. **grandiflorum** (Napper) E. Hossain, **comb. nov.**

Syn.: *Staurogyne alboviolacea* subsp. *grandiflora* Napper in Kew Bull. 24: 342 (1970).

var. **gracilius** (Heine) E. Hossain, **comb. nov.**

Syn.: *Staurogyne alboviolacea* var. *gracillior* Heine in Flore du Gabon No. 13: 123 (1966).

Thorough morphological and anatomical studies of the group throughout its geographical range have revealed that these two Central African species differ widely from the genuine species of *Staurogyne*. They are at once distinguished by calyx, corolla, stigma and seed characters.

In the form of calyx the new genus approaches *Saintpauliopsis*, another African genus, but differs in the characteristics of inflorescence, corolla, stamens, number of ovules, and seed surface.

A bilabiate corolla is also met with in some of the American species of *Staurogyne* but none of them is provided with a palate on the lower lip of the corolla. The number of ovules in each loculus varies from 12 to numerous in *Staurogyne*, while in the new genus they are only 6–8, supported by undurated retinacula in mature capsules. Further, the seeds in *Anisosepalum* are slightly flattened at the ventral side and the testa is rugose with a large hilar excavation. All other genera of this group (excluding *Elytraria* which possesses reduced bars on the testa cells) possess seeds which are provided with solid hooks on their testa cells.

Anatomically, the new genus and *Saintpauliopsis* share a common character in the absence of acicular fibres, while the rest of the genera in this group always have acicular fibres in roots, stems, petioles, and veins. The occurrence of peltate scales on the leaf lamina (particularly on the lower surface) and sometimes on the bracts and bracteoles is characteristic of the following genera only: *Staurogyne*, *Ophiorrhizophyllum*, *Gynocraterium* and *Anisosepalum*.

In the nature of pollen grains also (either tricolporoidate or tricolporate), the genus *Anisosepalum* shows resemblance to *Staurogyne*, *Ophiorrhizophyllum*, and surprisingly to *Nelsonia* which is in fact distantly related to this alliance. Corroborative evidence clearly indicates that *Staurogyne*, *Ophiorrhizophyllum*, *Gynocraterium*, *Saintpauliopsis*, and *Anisosepalum* form a complex but otherwise distinct and closely interrelated group of genera within the *Nelsonieae*.

**Elytraria** L. C. Rich

Subgen. **Tetrandra** E. Hossain, **subgen. nov.**

*Herbae* perennes, multiramosae. *Caulis* ad basin lignosus, prominenter articulatus. *Folia* verticillata, 2–6 ad nodum orientia, petiolata, lamina lanceolata vel late lanceolato-spathulata. *Inflorescentia* spicata, sessilis vel pedunculata, terminalis vel axillaris; pedunculi 1–4 e nodo orientes, pilis caespitosis instructi, inferne foliis squamiformibus sterilibus amplectentibus paucis vel numerosis instructi. *Bractee* squamiformes, aristatae. *Calyx*

profunde quadripartitus, lobo antico fere ad basin bifurcato. *Stamina* 4, inclusa; thecae antherarum in floribus maturis elongatae, in alabastro subglobosae, appendice distali semper prominente. *Staminodium* 1 vel 0 inconspicuum. *Ovarium* ovulis in utroque loculo circa 4-6 in series duas dispositis. *Capsula et semina* eis generi similia.

Typus subgeneris: *E. madagascariensis* (R. Ben.) E. Hossain, **comb. nov.**

Syn.: *Tubiflora madagascariensis* R. Ben. in Not. Syst. 12: 137 (1946).

Species duae in Madagascar.

***Elytraria nodosa* E. Hossain, sp. nov.** subgen. *Tetrandrae*; affinis *E. madagascariensi* sed inflorescentia ad basin foliis numerosis squamiformibus sterilibus instructis, bracteis ovatis glabris et bracteolarum carinis ciliolatis ab ea facile distincta.

*Herba* multo ramosa, verisimiliter perennis, circa 28 cm alta. *Caulis* ad basin ligneus, 2-3 mm diametro, manifeste articulatus, infra glaber, supra pubescens. *Folia* verticillata, 2-4 e nodis orientia, petiolata; petiolus 4-12 mm longus, minute pubescens; lamina late lanceolata, gracilis, 1.5-5 cm  $\times$  0.8-2.2 cm, subtus in venas sparsim pubescens, supra puberula. *Inflorescentia* terminalis et axillaris, spicata; pedunculi 1-4 e nodo pilis setaceis caespitosus instructo orientes, parte infera foliis squamiformibus rigidis sterilibus ovato-acutis spiraliter amplexentibus instructa; inflorescentia florifera 0.5-1.4 cm  $\times$  3-4.5 mm. *Bracteae* ovatae acutae concavae rigidae aristatae, marginibus hyalinae ad apice minute pubescentes, extra glabrae, 4.5 mm longae, 3 mm latae. *Bracteolae* lineari-lanceolatae, aristatae, concavae, 3.5-4  $\times$  0.5 mm latae, marginibus subhyalinae, apicibus et carinis pilis septatis ciliatae. *Lobi calycis* 4; lobus inferus fere ad basin profunde bifurcatus; omnes anguste elliptico-lanceolati, ad apicem scariosi, apicibus pilis septatis ciliati, 4-4.5 mm longi; lobus posticus ceteris paulo latior. *Corolla* bilabiata, extra et intra glabra. *Stamina* 4; filamenta puberula; antherae maturae elongatae, in alabastro subglobosae, lobis duobus in planis diversis locatis, appendicibus distalibus prominentibus; staminodium 1 or 0, pusillum et hyalinum. *Ovarium* glabrum; ovulis 4-5 utroque loculo in series duas dispositis. *Capsula* conica, glabra, circa 3.5 mm longa, in valvos duos lignosos recurvatos loculicide dehiscens.

MADAGASCAR: Voyage of M. Boivin, 1847-1852, *Bernier* Herb. No. 289 (holo. P); without locality, *Goudot*, Herb. Maire (P).

The two species, *E. madagascariensis* and *E. nodosa*, referred to subgen. *Tetrandra*, undoubtedly agree with the structural plan of *Elytraria*, but they have no close relatives. Features like the perennial woody habit, prominently articulated stems, and the occurrence of verticillate leaves are quite remarkable. Moreover these two species share a common character hitherto unknown in any other species of *Elytraria*, i.e. the presence of four fertile stamens with subglobose anther lobes (at least in buds) provided with prominent apical appendages.

Anatomically, these two species are usually distinguished by a zone of isolated pericyclic fibres encircling the vascular cylinder of the stem in transverse section. This feature seems to be one of the primitive ones in the *Nelsonieae*, as it is also found in the primitive sect. *Tetrastichum* Brem. of *Staurogyne*.

However, in the general habit, the subgen. *Tetrandra* superficially resembles *E. imbricata* (Vahl) Pers., a widely distributed species of America and Malaysia. But the subgen. *Tetrandra* shows at least a remote affinity with the Afro-Asiatic species, especially in the leaf arrangement, and in the lobing of the anterior calyx lobe.

All the existing species of *Elytraria* produce spikes which are borne on scapes, clothed with numerous rigid scale leaves, except *E. madagascariensis* which has entirely sessile spikes bearing a few (2-3) sterile bracts at the base.

Finally, these two species (*E. madagascariensis* and *E. nodosa*) are of great phytogeographic interest. They are confined to Madagascar and possess many features which seem to be primitive in the genus *Elytraria*.

### **Staurogyne Wall.**

Subgen. **Tetrastichum** Brem. in Reinwardtia 3: 166 (1955) emend.

Sect. I **Tetrastichum** (Brem.) E. Hossain, **stat. nov.**

Typus sectionis: *S. spatulata* (Bl.) Kds.

**S. cambodiana** (R. Ben.) E. Hossain, **stat. nov.**

Syn.: *S. polybotrya* Nees var. *cambodiana* R. Ben. in Bull. Soc. Bot. France 60: 267 (1913).

**S. polybotrya** Nees var. *humilis* (Nees) E. Hossain, **comb. nov.**

Syn.: *Ebermeiera humilis* Nees in Wall., Pl. As. Rar. 3: 80 (1832).

*S. humilis* (Nees) O. Kuntze, Rev. Gen. Pl. 1: 497 (1891).

**S. polybotrya** Nees var. *thorelii* (R. Ben.) E. Hossain, **comb. nov.**

Syn.: *S. glauca* Nees var. *thorelii* R. Ben. in Bull. Soc. Bot. France 60: 266 (1913).

Sect. II **Zenkerina** (Engl.) E. Hossain, **comb. et stat. nov.**

Syn.: *Zenkerina* Engl. in Bot. Jahrb. 23: 497 (1897).

*Neozenkerina* Mildbr. in Notizbl. Bot. Gart. Berlin 7: 491 (1921).

*Staurogynopsis* Mangenot & Aké Assi in Bull. Jard. Bot. Brux. 29: 27 (1959).

Typus sectionis: *Staurogyne kamerunensis* (Engl.) R. Ben.

Syn.: *Zenkerina kamerunensis* Engl. in Bot. Jahrb. 23: 498 (1897).

**Staurogyne dolichocalyx** E. Hossain, **sp. nov.** in subgen *Tetrasticho* valde distincta foliis supra glabris infra in venas solum pubescentibus et bracteis et bracteolis et lobis calycis grandis anguste lanceolatis longi-acuminatis distinguitur. Remote affinis *S. kamerunensi* inflorescentia, bracteis, bracteolis et lobis calycis longis et fructu tarde dehiscente.

*Herba* erecta, circa 30 cm alta, ad basin sublignea, *Caulis* leviter sulcatus, infra glabrescens vel tomentellus, supra tomentosus, ad basin circa 3.5 mm diametro, plerumque non ramosus, interdum inferne ramis brevibus gracilibus instructus, articulatus. *Folia* opposita, petiolata; petiolus 1.5-4 cm longus, tomentosus vel tomentellus; lamina elliptico-lanceolata, 5-13 × 2-4.5 cm lata, herbacea, integra, acuta, superne glabra, inferne in venas solum pubescens, ad basin attenuata. *Inflorescentia* terminalis vel axillaris, racemosa, simplex, leviter nutans et post anthesin elongata. *Flores* breviter pedicellati; pedicelli 0.8-1 mm longi, sub fructu usque ad 5 mm longi,

tomentosi. *Bracteae* anguste lanceolatae, acuminatae, trinervae, ad pedicellos aliquanto adnatae pubescentes. *Bracteolae* fere ad apicem pedicellorum anguste lanceolatae, acuminatae, pubescentes. *Lobi calycis* subaequales, omnes anguste lanceolati, longi-acuminati, trinervi, puberuli vel parce pubescentes; lobus posticus  $1.8-2.2 \times 2-2.5$  mm; lobi laterales  $1.6-2 \times 1.2$  mm; lobi antici  $1.8-2.1 \times 1.8-2$  mm. *Corolla* azurea, fragrans, extra in alabastro scabrida, floris aperti nondum visa. *Stamina* 4; filamenta hirsuta; staminodium nondum visum. *Stigma* bifurcatum, lobi inaequalibus. *Ovarium* glabrum; ovulis in utroque loculo circa 60 vel pluribus in series quattuor dispositis. *Capsula* anguste ellipsoidea, apice acuto crasso provisa, tarde dehiscens. *Semina* parva, angulari-globosa; testa foveolata, unci minutis solidis instructa.

INDO-CHINA (VIETNAM); Taai Wong Mo Shan, & vicinity Chuk-Phai, Ha-Coi Tonkin, ann. 1936, *W. T. Tsang* 27028 (holo. E, iso. K); *ibid.* 3 v—22 vi 1939, *W. T. Tsang* 29001 (E, P.).

This is a distinct species in subgen. *Tetrastichum*, and can at once be identified by its large, narrowly lanceolate, long acuminate bracts, bracteoles and calyx lobes together with its large, ellipsoid-acuminate fruits. Its affinity with any other known Asiatic species of this subgenus is remote. But it does approach one species from Africa, *S. kamerunensis*. The two species agree in their inflorescence, long bracts, bracteoles, and calyx lobes and the tardily dehiscent fruits. It is remarkable to find an Asiatic species in the hitherto African section *Zenkerina*.

#### Subgen. *Staurogyne*

##### Sect. III *Staurogyne*

Typus subgeneris et sectionis: *S. argentea* Wall.

Subsect. 1. *Macrosepalia* Brem.

Typus subsectionis: *S. argentea* Wall.

*S. argentea* Wall. var. *angustifolia* (Wall.) E. Hossain, stat. nov.

Syn.: *S. angustifolia* Wall., Pl. As. Rar. 2: 80 (1831).

*S. euryphylla* E. Hossain, nom. nov.

Syn.: *Ebermaiera riedeliana* Nees var *latifolia* Nees in Mart., Fl. Bras. 9: 19 (1847)—non *S. latifolia* Brem. (1969).

*Staurogyne inaequalis* E. Hossain, sp. nov. valde affinis *S. shanicae* W. W. Smith sed foliis supra glabris, bracteis majoribus ad medium pedicellum adnatis, inflorescentiis densis et pedicellis minoribus differt.

*Herba* erecta, circa 40 cm. *Caulis* cylindricus, laxe ramosus, tomentosus; ramificatio sympodialis. *Folia* omnia opposita, petiolata; petiolus 0.5–2 cm, tomentosus vel villosus; lamina elliptica, elliptico-lanceolata vel oblongo-lanceolata, apice obtusa vel subobtusa, margine repanda, supra glabra infra in venis pubescens. *Inflorescentia* axillaris et terminalis sessilis vel subsessilis, ramosa, semper ad basin foliis binis redactis suffulta; pedunculus nunquam ultra 2 mm; rhachis et pedunculus albo-tomentosus. *Bracteae*, bracteolae et lobi calycis puberuli, marginibus parce ciliolati. *Bracteae* lanceolati-spathulatae,  $6-8 \times 1.5-2$  mm, usque ad medium pedicellum

adnatae. *Bracteolae* ad apicem pedicelli insertae, lineari-subspathulatae, 5–6 mm longae. *Lobi calycis* profunde dissimilares; antici lanceolati-spathulati; ceteri lineari-lanceolati; lobus posticus usque ad  $8 \times 0.5\text{--}0.7$  mm; lobi laterales  $5\text{--}6 \times 0.4$  mm; lobi antici prominentes, usque ad  $10 \times 1.2\text{--}1.5$  mm. *Corolla* alba, subactinomorpha, 1.5–2 cm; tubus 1.3–1.5 cm, extra glaber, intra ad insertionem staminum glanduloso-pubescent. *Stamina* 4; filamenta parvis inferioris puberula; staminodium 1, breve. *Stylus* glaber. *Stigma* trifurcatum et cruciatum. *Ovarium* glabrum; ovulis in utroque loculo circa 24 in series duas dispositis. *Capsula* nondum visa.

THAILAND. Phitsanulok, Phu Mieng mountain, evergreen forest, 1300 m, 27 vii 1966, Larsen, Smitinand & Warncke 929 (holo. AAU).

This new species is remarkable for its resemblance to *S. singularis* Brem. which is placed under a different subsection (*Microchlamydeae*).

***Staurogyne atropurpurea* E. Hossain, sp. nov.**; affinis *S. lasiobotridi* (Nees) O. Kuntze sed indumento foliorum, lobis calycis longioribus et floribus majoribus, corollis prominenter atropurpureis ab ea facile distinguitur.

*Plantae* suffrutices. *Caulis* non ramosus, brunneus et pubescens. *Folia* petiolata; petiolus pubescens, 2–3 cm longus; lamina lanceolata vel elliptico-lanceolata, supra strigis brevibus sparsis, infra puberula vel pubescens. *Inflorescentia* racemosa laxa et cernua, terminalis et axillaris, ramis 2–3 provisa; pedunculus albo-tomentosus pilis glandulosis et eglandulosis instructus. *Flores* pedicellati; pedicelli 1–2 mm longi. *Bracteae*, *bracteolae* et lobi calycis omnes dense hirtelli pilis longis septatis eglandulosis et glandulosis brevioribus intermixtis. *Bracteae* 6–8 mm, lineari-lanceolatae, acutae. *Bracteolae* usque ad 6 mm, filiformes, acutae. *Lobus posticus calycis* usque ad  $12 \times 1$  mm; lobi laterales  $8\text{--}8.5 \times 0.5$  mm; lobi antici  $11\text{--}12 \times 0.5\text{--}0.7$  mm, omnes lineari-triangulares, sensim in acumina tenuia terminantes. *Corolla* atropurpurea, 2.8–3 cm; tubus 2.2–2.3 cm, extra glanduloso-pubescent, intra ad insertionem filamentorum parce pubescens. *Stamina* 4; filamenta glanduloso-hirta; staminodium breve. *Stigma* profunde bifurcatum, lobus inferior brevior et crassus. *Discus* annularis et pulviniformis. *Ovarium* glabrum; ovula in utroque loculo 20–24 in series duas disposita. *Capsula* nondum visa.

THAILAND. Song Thaw, 1 xi 1962, evergreen forest, 800 m, K. Larsen 9457 (holo. K).

***Staurogyne grandiflora* E. Hossain, sp. nov.**; affinis *S. majori* R. Ben. sed habitu robusto caule et petiolo glabrescenti, foliis grandibus paginis superis glabris et corolla atro-rubra intus glabra ab ea facile distinguenda.

*Herba* erecta, non ramosa. *Caulis* infra glabrescens, supra brunneo-puberulus, 4.5 mm diametro. *Folia* opposita, petiolata; petiolus 3–5 cm longus, infra glaber, supra minute puberulus; lamina  $15\text{--}22 \times 7\text{--}7.5$  cm, late elliptico-lanceolata vel oblongo-lanceolata, acuminata, gracilis, basi contracta, margine repanda, nitidulo-viridis, supra glabra, infra griseo-alba venis minute puberulis. *Inflorescentia* terminalis, cernua, racemosa, pauciramosa; pedunculus brevis, 1 cm longus, rhachide pilis glandulosis et eglandulosis hirtella. *Flores* pedicellati; pedicelli 2–3 mm longi, pilis glandulosis et eglandulosis pubescentes. *Bracteae*, *bracteolae* et lobi calycis pilis glandulosis et

eglandulosus hirtelli. *Bracteeae* lineari-triangulares, acutae, uninervae, 4-5 mm longae. *Bracteolae* ad apicem pedicellorum, bracteis similes. *Lobi calycis* subsimiles; laterales 9-9.5 × 0.5-0.7 mm; ceteri 10-11 × 0.9-1 mm, omnes trinervi, lineari-triangulares, acuti. *Corolla* atro-rubra, circa 2.6 cm longa, lobi 3-4 mm longi, extra glanduloso-puberuli, intra glabri praesertim juveniles; tubus contractus supra expansus. *Stamina* 4; filamenta parce pilis minute glandulosus hirta; staminodium 1.5 mm longum, apice capitatum. *Stigma* profunde bifurcatum. *Ovarium* glabrum, ovulis in utroque loculo circa 34-36 in series duas dispositis. *Capsula* nondum visa.

BURMA. Tavoy District, Kaleinaung Reserve, 305 m, 28 i 1925, *Ba Pe* 833 (holo. K).

*Staurogyne aristata* E. Hossain, *sp. nov.*; a *S. longifolia* (Nees) O. Kuntze inflorescentia condensata subspicata floribus sessilibus, a *S. argentea* Wall. foliis latioribus, floribus majoribus, stigmate bifurcato cavo, ad ambabus sclereideis in foliis praesentibus facile distinguenda.

*Herba* monopodialis, usque ad 18 cm longa. *Caulis* minute tomentosus, 4.5 mm longus, crassus. *Folia* opposita, petiolata; petiolus 1-2.5 cm longus, brunneo-tomentosus, leviter alatus; lamina late elliptico-lanceolata, integra vel obscure repanda, supra glabra, infra in venis minute pubescens vel puberula, brunnea. *Inflorescentia* terminalis, subspicata, racemosa. *Bracteeae et bracteolae* usque ad 1.4 cm longae, lineari-lanceolatae, in acuminem subuliformem contractae, puberulae; bracteolae ad apicem pedicellorum dispositae. *Lobi calycis* dissimiles, pubescentes, margine ciliolati; lobi laterales usque ad 8 mm, ceteri 13.5 mm longi, lineari-lanceolati, in acuminem subuliformem (lateralibus exceptis) contracti. *Corolla* alba; tubus ad basin contractus, supra expansus, extra puberulus, intra ad insertionem filamentorum barbatus, circa 2 cm longus; lobi 3-4 mm longi. *Stamina* 4, filamentis glanduloso-hirtellis; staminodium 1, 1-3 mm longum, apice bilobatum. *Stigma* bifurcatum, cavum. *Ovarium* glabrescens, ovulis in utroque loculo 24-28 in series duas dispositis. *Capsula* 5.5 mm longa, elongata, puberula, in valvos duos recurvatos loculicide dehiscens.

THAILAND. Trang, Chawng, Ton Nam Pleie, c. 100 m, 14 xi, *T. Smitinand & E. C. Abbe* 6139 (holo. K).

*Staurogyne filipes* E. Hossain, *sp. nov.*; species ab aliis ut videtur remota sed *S. amaenae* R. Ben. in characteres inflorescentiarum, bractearum, bractearum et calycum similis, foliis brevioribus lanceolatis vel elliptico-lanceolatis, calycibus et corollis brevioribus et indumento insigniter distincta.

*Herba* ramosa vel non ramosa, 12-35 cm longa. *Caulis* tomentosus, brunneus, 2.5-3 mm diametro. *Folia* omnia opposita, petiolata; petiolus 0.5-4 cm longus, parce tomentosus, brunneus; lamina 3-10.5 × 1-3 cm lata, lanceolata vel elliptico-lanceolata, acuta vel subacuta, integra vel obscure repanda, ciliata vel ciliolata, supra dense strigulosa vel pilosa, infra pubescens. *Inflorescentia* laxa, racemosa, simplex, in ramis axillaribus et terminalis, floribus 6-8; rhachis glanduloso-hirtella. *Flores* distincte pedicellati; pedicelli 2-8 mm longi, glanduloso-hirtelli vel pilis glandulosus et eglandulosus instructis. *Bracteeae, bracteolae et lobi calycis* pilis glandulosus et eglandulosus hirtelli; bracteeae lineares vel lineari-lanceolatae, acutae vel subacutae, uninervae, 2.5-5.5 mm longae; bracteolae fere ad apicem pedicellorum

dispositae, lineari-acutae, uninervae, 3-5 mm longae. *Lobi calycis* sub-similes vel dissimiles, laterales 4.5-6.5 mm, ceteri 6.5-11 mm longi, omnes trinervi. *Corolla* albida vel pallide rosea, fauce purpureo-lincata, 10-12 mm longa; tubus extra pubescens vel glanduloso-pubescens, intra ad insertionem filamentorum barbellata. *Stamina* 4; filamenta glanduloso-hirta, pilis aliquando eglandulosis instructa; staminodium 1, 0.5 mm longum. *Stigma* trifurcatum, cruciatum. *Ovarium* glabrum, ovulis in utroque loculo 26-28 in series duas dispositis. *Capsula* puberula, elongato-conica, circa 5 mm longa, mucronulata.

Two distinct variants can be recognized: they are not given any formal latin names owing to the limited material.

Varietas typica: Pedicelli 2-6 mm longi; bracteae lineari-acutae, 2.5-3.5 mm longae.

LAOS: Muang Huang, Wiengchan, c. 200 m, in evergreen bamboo forest, 31 iii 1932, *A. F. G. Kerr* 21771 (holo. K.); Muang Huang, Wiengchan, c. 200 m, in evergreen forest, 29 iii 1932, *A. F. G. Kerr* 20793 (BM, K).

Varietas B: Pedicelli 6-8 mm longi; bracteae lineari-lanceolatae, 4.5-5 mm longae.

THAILAND: Betang, Pattani, c. 400 m, evergreen forest, 1 viii 1923, *A. F. G. Kerr* 7442 (BM); Betang, Pattani, 400 m, evergreen forest, 24 viii 1923, *A. F. G. Kerr* 7920 (BM).

#### Subsect. 2. *Macrochlamydeae* Brem.

Typus subsectionis: *S. longispica* (Ridl.) Ridl.

***Staurogyne longibracteata* E. Hossain, sp. nov.**; affinis *S. longispicae* (Ridl.) Ridl. et *S. cuneatae* Imlay; a prima bracteis quinquenervis, corolla majore, inflorescentia non ramosa spiciformi, ovario ovulis in utroque loculo circa 36-40 differt; a secundo forma bractearum, floribus majoribus et planta glabra recedit.

*Herba* erecta, 30-40 cm alta. *Caulis* 2-3 mm diametro, brunneolus, basi leviter lignescens, inferne pilis brevissimis indutus, sursum glaber. *Folia* omnia opposita; petiolus 2-4 cm longus, glabrescens vel pilis parvis vestitus; lamina lanceolata, acuta, integra, basi contracta vel cuneata, supra pallide viridis, glabra, subtus glabrescens, rubro-brunnea, venis prominentibus plerumque pilis brevis brunneolis provis, 6-16 × 2-6 cm. *Inflorescentia* terminalis, simpliciter racemosa, spiciformis; pedunculus brevis, usque ad 1 cm longus, rhachide glabra. *Flores* brevissime pedicellati; pedicelli plerumque 1-2 mm longi, sub fructu usque ad 3 mm attingentes. *Bracteae* elliptico-lanceolatae vel elliptico-obovatae, obtusae vel mucronulatae, pallido-brunneae, quinquenerves, 1-1.6 × 5-6.5 mm, glabrae. *Bracteolae* lineari-lanceolatae, acutae vel subacutae, trinerves, 6-8 × 0.5-1 mm, glabrae. *Calycis lobi* subaequales; lobus posticus 3-3.5 mm longus, 1 mm latus, ceteri 2-2.8 mm longi, 0.6-0.9 mm lati, omnes triangulares, acuti, glabri. *Corolla* matura 2-2.6 cm longa, insuper usque ad 6.5 mm lata, extra glabra, intra papillosa ad insertionem filamentorum dense barbellata; apices loborum minute pubescentes, rubri. *Stamina* 4; filamenta et antherae glanduloso-hirta; staminodium breve, 0.8-1 mm longum, ecapitatum. *Stigma* latum, cavum, bilobatum; lobus supernus fimbriatus, lobus infernus iterum furcatus.

*Ovarium* glabrum, ovulis in utroque loculo 36-40 in series duas dispositis. *Capsula* glabra, ovato-elongata, mucronulata, usque ad  $7.5 \times 2.5$  mm lata, in valvos duos recurvatos lignosos loculicide dehiscens. *Semina* globosa; testa foveolata processibus uncinatis minutis crispis praedita.

BURMA. Tenasserim division, Tavoy district: hillside W of Paungdaw power station, c. 305 m, viii 1961, Keenan, Tun Aung & Rule 940 (holo. E); *ibid.*, 671 m, Keenan *et al* 860 (E); *ibid.*, 640 m, Keenan *et al*. 801 (E);  $2\frac{1}{2}$  miles east of Paungdaw power station, 366 m, 22 viii 1961, Keenan *et al*. 1121 (E).

### Subsect. 3. *Microchlamydeae* Brem.

Typus Subsectionis: *S. merguensis* (T. And.) O. Kuntze.

*Staurogyne subrosulata* E. Hossain, *sp. nov.* affinis *S. rosulatae* Brem. subsectionis *Macrosepalarum* sed inflorescentia paniculiformi multo ramosa, pedunculo longo suffulta, bracteis et bracteolis minutis triangularibus et corolla prominenter hirsuta ab ea distinguenda. Bracteae lineares vel lineari-lanceolatae pedicellis adnatae in *S. rosulata* sed in *S. subrosulata* bracteae et pedicelli liberi.

*Herba* subrosulata, circa 30 cm (inflorescentia inclusa) longa. *Caulis* tomentosus. *Folia* petiolata; petiolus 1-4 cm longus, tomentellus; lamina elliptico-lanceolata, subacuta, integra, supra puberulo-pubescent, infra minute puberula venis prominentibus tomentellis, 7-15 cm  $\times$  4-6 cm, basi contracta. *Inflorescentia* terminalis vel subterminalis; pedunculi multi, 4-6 cm, supra paniculatum ramosi, puberuli. *Flores* breviter pedicellati; pedicelli 0.5-1 mm puberuli. *Bracteae et bracteolae* triangulari-lanceolatae, acutae, puberulae, margine ciliatae, usque ad 2 mm  $\times$  0.8 mm. *Lobi calycis* elliptico-lanceolati, subaequales, acuti, 5.5-6 mm longi; lobus posticus 1-1.2 mm, antici 0.8 mm et lobi laterales 0.5 mm lati, omnes scabridi marginibus ciliati. *Corolla* azureo-purpurea, 1.6-1.8 cm longa, insuper usque ad 2.5 mm lata, extra prominenter hirta, intra ad insertionem filamentorum pubescens. *Stamina* 4; antherae dorsaliter hirtae, lobis basi mucronulatis; filamenta glanduloso-hirta; staminodium 1, breve, 0.5 mm longum, ecapitatum. *Stylus* ad apicem cavus. *Ovarium* glabrum, ovulis in utroque loculo in series duas dispositis. *Capsula* nondum visa.

THAILAND, central. Sarika Falls at Nakhon Nyok, 300 m, 14 viii 1968, Larsen Santisuk & Warncke 3398 (holo. AAU).

*Staurogyne diandra* E. Hossain, *sp. nov.*; species propria generis *Staurogyne* per stamina dua perfecta et duo vel tres staminodia—nulli specie subsectionis *Microchlamydearum* arcte affinis sed *S. vicinae* R. Ben. distanter affinis praesertim in inflorescentia et in corolla glabra subactinomorpha.

*Planta* suffruticosa, circa 64 cm alta. *Caulis* basi ligneus, pubescens, 4 mm crassus. *Folia* omnia opposita petiolata; petiolus 1.5-6 cm longus, pubescens; lamina 5-15  $\times$  2.5-6 cm, elliptico-lanceolata, acuta, margine obscure repanda, supra glabra, infra praeter venas glabrescens. *Inflorescentia* terminalis racemosa; pedunculus 3.5 cm longus, axis pubescens. *Flores* breviter pedicellati; pedicelli 2-3 mm longi, minute pubescentes. *Bracteae et bracteolae* lineari-lanceolatae, acutae, glabrae; bracteae 5-6 mm et bracteolae 4.5-5 mm longae. *Lobi calycis* dissimiles, omnes lineari-triangulari acuti, glabri; lobus posticus 6-8 mm longus, 7-nervus; lobi laterales

5-6 mm longi, trinervi; lobi antichi 6-8.5 mm longi, 5-nervi. *Corolla* 2-2.5 cm longa, insuper usque ad 5.5 mm lata; lobi 2.5-3 mm longi, extra et intra glabra. *Stamina* 2, filamenta glabra; staminodia 2 vel 3, duo semper prominentia, 3-4.5 mm longa, apice bifurcata. *Stigma* breviter bifurcatum, lobo uno altero brevior et crassior. *Ovarium* glabrum, ovulis in utroque loculo 27-28 in series duas dispositis. *Capsula* nondum visa.

INDOCHINA (VIET NAM). Tonkin, Chapa, 1900 m, iv 1936, *Pételot* 5928 (holo. P).

A unique species in the genus *Staurogyne* in having only two fertile stamens and 2 or 3 staminodes. Its true relationship is uncertain at present.

*Staurogyne spiciformis* E. Hossain, sp. nov. Affinis *S. vicinae* R. Ben. sed foliis utrinque pubescentibus vel puberulis, lobis calycis breviter pubescenti-ciliolatis, corollis breviter puberulis et staminibus filamentis minute glanduloso-hirtis differt.

*Herba* non ramosa, 10-24 cm alta. *Caulis* 1.5-2 mm diametro, pilis brunneolis pubescens. *Folia* omnia opposita, petiolata; petiolus 1-3 cm longus, brunneolo-pubescent; lamina oblongo-lanceolata, acuta vel subacuta, basi contracta, margine obscure repanda, minute pubescens, 4-12 × 1.5-3.8 cm, supra minute pubescens, subtus puberula in venis semper dense pubescens. *Inflorescentia* terminalis vel axillaris spicata; axis pubescens, non ramosa. *Bracteae* lineari-lanceolatae, usque ad 4 mm longae, minute pubescentes, marginibus ciliolatae. *Bracteolae* ad apicem pedicellorum usque ad 2 mm triangulari-acutae, minute pubescentes, marginibus ciliolatae. *Lobi calycis* leviter dissimiles, omnes trinervi, minute pubescentes, marginibus ciliolati; lobus posticus 2.8-3.5 mm; lobi laterales 2.6-3 mm et lobi antichi 3.5-4 mm longi, omnes lineari-triangulares, acuti. *Corolla* subactinomorpha, 10-11.5 mm longa, usque ad 2.5-3.5 mm lata; tubus externe puberulus, interne ad insertionem filamentorum hirtellus. *Stamina* 4; filamenta minute glanduloso-hirta; staminodium 1, 0.3 mm longum, album. *Stigma* profunde bifurcatum. *Ovarium* glabrum, ovulis in utroque loculo 16-17 in seriebus duobus dispositis. *Capsula* nondum visa.

CAMBODIA. Crescit prope rivum in montibus Epong, 1200 m, vi 1870, *L. Pierre* 1075 (holo. P, iso P).

*Staurogyne kerrii* E. Hossain, sp. nov. affinis *S. merguensi* (T. And.) O. Kuntze et *S. tenuispicae* Brem. sed habitu, foliis ellipticis obovatis vel oblongis supra pilosis, et lobis calycis triangulari-linearibus acuminatis pubescentibus et ciliatis differt.

*Herba* ramosa vel non ramosa, 15-30 cm alta. *Caulis* decumbens et ad basin ligneus, ad nodos radicans, inferne sparsim pubescens, superne tomentosobrunneus. *Folia* opposita, petiolata; petiolus 1-5 cm longus, sparsim vel dense tomentosus, lamina elliptica, obovata vel oblonga, 5-10 × 2-4.5 cm, obtusa vel subobtusa, subherbacea, margine obscure repanda, ciliolata, basi leviter inaequalis vel subcordata, supra pilosa, infra minute pubescens venis tomentosus incano-brunnea. *Inflorescentia* terminalis vel axillaris pauciramosa paniculata; pedunculus brunneolo-ruber, pubescens; rhachis inferne pubescens, ad apicem glanduloso-hirtella. *Flores* breviter pedicellati; pedicelli sub fructu usque ad 2 mm longi, pubescentes. *Bracteae*

lineari-lanceolatae, acutae, 2.5–3 mm longae, minute pubescentes. *Bracteolae* ad apicem pedicellorum lineari-triangulares, acutae, 1.5–2 mm longae, minute pubescentes. *Lobi calycis* inaequales, triangulari-lineares, acuminati, apice rubro, pubescentes et ciliati pilis glandulosis brevibus et eglandulosis longis intermixtis; laterales usque ad 3 mm, ceteri 3.5–4 mm longi. *Corolla* alba, 10–12 mm longa, insuper usque ad 2.5 mm lata; lobi purpurei, 1–1.5 mm longi, extra ciliolati; tubus extra glanduloso-hirtellus, intra ad insertionem filamentorum pubescens. *Stamina* 4; filamenta glanduloso-hirta; staminodium prominens, 1 mm longum, capitatum et ad apicem bifurcatum. *Stigma* bifurcatum. *Ovarium* glabrum, ovulis in utroque loculo in series duas dispositis. *Capsula* nondum visa.

THAILAND. Tasan, Chumpaun, 150 m, 23 xii 1928, *A. F. G. Kerr* 16307 (holo. BM); Klaung Hin Kao, Petalung, c. 300 m, 18 iv 1928, *A. F. G. Kerr* 15287 (BM).

The most interesting aspect of *S. kerrii* lies in its leaf anatomy. Both *S. merguensis* and *S. tenuispica* possess diffuse astrosclereids in their leaf lamina while *S. kerrii* has a pseudo-terminal, less branched type of sclereid. This is also found in *S. aristata* of the subsect. *Macrochlamydeae* and in *S. humifusa* Benth. of the subsect. *Microchlamydeae*. However, both these species differ widely from *S. kerrii* in several important taxonomic characters.

*Staurogyne singularis* Brem. var. *longipedicellata* (Brem.) E. Hossain, comb. nov.

Syn.: *Staurogyne bella* Brem. var. *longipedicellata* Brem. in Dansk. Bot. Ark. 27, 1: 74 (1969).

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